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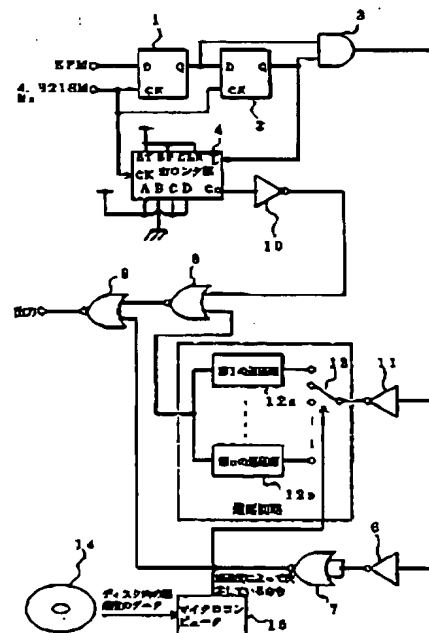
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(54)【発明の名称】 光ディスクの記録信号生成回路

(57)【要約】

【目的】 光ディスクの記録信号生成回路において、光ディスクの線速度に最適な3T伸長信号(記録信号)を得る。

【構成】 光ディスク14の記録動作時に、EFMの変調方式による信号("0"あるいは"1"が続く3T乃至11Tの信号)を-1Tして2T乃至10Tの信号とし、この2T乃至10Tの信号を所定時間遅延するとともに、この遅延した信号を上記-1Tした2T乃至10Tの信号の2T信号だけに加算して記録信号を生成する記録信号生成回路において、上記-1Tした2T乃至10Tの信号を上記光ディスク14内のATIP信号により線速度のデータを読み取るとともに、この読み取った線速度に応じて上記スイッチを切り替えるマイクロコンピュータ15とを備え、上記光ディスク14の線速度に応じた遅延時間を設定可能としている。



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## 【特許請求の範囲】

【請求項1】 光ディスクの記録動作時に、EFMの変調方式による信号の3T乃至11Tの信号を-1Tして2T乃至10Tの信号とし、該2T乃至10Tの信号を所定時間遅延するとともに、該遅延した信号を前記-1Tした2T乃至10Tの信号の2T信号だけに加算して記録信号を生成する光ディスクの記録信号生成回路において、

前記-1Tした2T乃至10Tの信号を前記光ディスクの線速度に応じて所定時間遅延する複数の遅延手段と、  
該複数の遅延手段のいずれを選択する選択手段と、  
前記光ディスク内のATIP信号により線速度のデータを読み取るとともに、該読み取った線速度に応じて前記選択手段の制御を行う制御手段とを備え、  
前記光ディスクの線速度に応じた遅延時間を設定し、前記-1Tした2T乃至10Tの信号を同設定した遅延時間だけ遅延するようにしたことを特徴とする光ディスクの記録信号生成回路。

## 【発明の詳細な説明】

【0001】

【産業上の利用分野】この発明はEFM(Eight to Fourteen Modulation)と呼ばれる変調方式による信号("0"あるいは"1")を3T伸長信号に変換して記録信号を得る光ディスクの記録信号生成回路に関するものである。

【0002】

【従来例】従来、この種の記録信号生成回路は、例えば光ディスクのジッタ低減のために、図2に示す構成をしており、EFMによる信号("0"あるいは"1")が続く長さ;3T乃至11T)をチャネルクロック(4、3218MHz)の1クロック分遅延する第1のDタイプF・F(フリップ・フロップ)部1と、この1クロック遅延した信号(図3(c)に示す)をさらに1クロック分遅延する第2のDタイプF・F(フリップ・フロップ)部2と、それら1クロック遅延した信号と2クロック遅延した信号との論理積をとり、-1Tした2T乃至10Tの信号(図3(e)に示す)を得るための2アンド回路3と、上記チャネルクロックをカウンタクロックとし、第2のDタイプF・F(フリップ・フロップ)部2のQ出力信号で2クロックカウントするカウンタ部4と、上記2アンド回路3の出力信号(2T乃至10T信号)の反転信号を所定時間遅延する遅延回路5と、上記2アンド回路3の出力信号を波形整形するためのインバータ回路6および第1のノア回路7と、上記遅延した2T乃至10T信号と上記カウンタ部4の2クロックカウントによるキャリア信号(Co)とを論理和する第2のノア回路8と、この第2のノア回路8の出力信号と上記波形整形した2アンド回路3の出力信号とを論理和する第3のノア回路9とを備えている。なお、10、11はインバータである。

【0003】上記構成の記録信号生成回路によると、図3(e)に示すように、上記アンド回路3からは、上記EFMによる3T乃至11Tの信号から-1した2T乃至10Tの信号が出力される。これら2T乃至10Tの信号が遅延回路で所定時間( $\alpha$ (ns))遅延され、この遅延した信号を上記2T乃至10Tの信号の2T信号にだけ加算して記録信号(3T伸長信号)を得るようにしている(図(k)に示す)。

【0004】

【発明が解決しようとする課題】ところで、上記光ディスクの記録信号生成回路においては、1種類の光ディスク(所定線速度のディスク)に対しては適用することができるが、つまり1つの伸長時間しか決めることができず、光ディスクとしては何種類の線速度(例えば1.2m/s~1.4m/s)のものがあつて、これら全ての光ディスクに対して最適な記録信号を得ることができなかった。

【0005】この発明は上記課題に鑑みなされたものであり、その目的は各光ディスクの線速度に応じて最適な記録信号(3T伸長信号)を得ることができるようにした光ディスクの記録信号生成回路を提供することにある。

【0006】

【課題を解決するための手段】上記目的を達成するために、この発明は光ディスクの記録動作時に、EFMの変調方式による信号("0"あるいは"1")が続く長さ;3T乃至11T)を-1Tして2T乃至10Tの信号とし、この2T乃至10Tの信号を所定時間遅延するとともに、この遅延した信号を上記-1Tした2T乃至10Tの信号の2T信号だけに加算して3T伸長信号(記録信号)を生成する光ディスクの記録信号生成回路において、上記-1Tした2T乃至10Tの信号を上記光ディスクの線速度に応じて所定時間遅延する複数の遅延部と、この複数の遅延部のいずれを選択するスイッチと、上記光ディスク内のATIP信号により線速度のデータを読み取るとともに、この読み取った線速度に応じて上記スイッチを切り替えるマイクロコンピュータとを備え、上記光ディスクの線速度に応じた遅延時間を設定するようにしたことを要旨とする。

【0007】

【作用】上記構成としたので、上記光ディスクの記録動作にあつては、上記マイクロコンピュータにて同光ディスクの線速度のデータが得られ、このデータに応じて上記複数の遅延部のいずれかが選択される。

【0008】これにより、上記-1Tした2T乃至10Tの信号がその設定遅延時間だけ遅延され、この遅延した信号を同2T乃至10Tの信号2T信号にだけ加算して3T伸長信号(記録信号)が得られるため、上記線速度に最適な記録信号を得ることができ、各異なる線速度の光ディスクに適用することができる。

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【0009】

【実施例】以下、この発明の実施例を図1に基づいて説明する。なお、図中、図2と同一部分には同一符号を付し重複説明を省略する。

【0010】図1において、この発明の光ディスクの記録信号生成回路は、図2に示す遅延回路5に代えてそれぞれ異なる遅延時間を設定可能とする第1乃至第nの遅延部12a、…、12nおよびこれら遅延部12a、…、12nを選択するスイッチ13を備えている。

【0011】また、この記録信号生成回路は、上記スイッチ13を切り替えるために、光ディスク14内のATIP信号に含まれている当該光ディスクの線速度のデータを読み取るとともに、この読み取った線速度のデータに応じて第1乃至第nの遅延部12a、…、12nの選択指示を出すマイクロコンピュータ15を備えている。

【0012】上記構成の光ディスクの記録信号生成回路においては、EFM (Eight to Fourteen Modulation) と呼ばれる変調方式による信号（“0”あるいは“1”が続く長さ：3T乃至11T 3T乃至11Tの信号）から3T伸長信号（記録信号）を生成するに際し、マイクロコンピュータ15にて光ディスク14内（ATIP信号に含まれている）の線速度のデータが読み取られ、この読み取ったデータに応じて上記スイッチ13を切り替える制御信号が出力される。

【0013】すなわち、上記光ディスク14の線速度に最適な記録信号が生成されるように、アンド回路3から出力される-1した2T乃至10Tの信号（図3（e）を参照）の遅延時間が最適に設定される。

【0014】続いて、従来同様に、上記-1して2T乃至10Tの信号が遅延され、この遅延した信号が2Tの信号にだけ加算され、この加算した信号が記録信号（3T伸長信号）にされる（図3（k）を参照）このように、異なる線速度に光ディスクの記録動作に際し、同光ディスクの線速度に応じて自動的に上記遅延時間が設定され、最適な記録信号（3T伸長信号）を得ることができる。

【0015】また、上記記録した光ディスク14の再生に際しては、光ディスクの線速度にあった3T伸長信号によって記録していることから、アイバタンのジッタを低減することができ、エラーレイトの低減を図ること

ができる。

【0016】

【発明の効果】以上説明したように、この発明の記録信号生成回路によれば、EFMによる信号（3T乃至11Tの信号）を-1した2T乃至10T信号とし、これら2T乃至10Tの信号をしょてい時間遅延し、この遅延した時間を2T信号にだけ加算して記録信号（3T伸長信号）を得る光ディスクの記録信号生成回路において、異なる遅延時間の遅延部と、これら遅延部を切り替えるスイッチと、上記光ディスク内（ATIP信号内）の線速度のデータを読み取り、この読み取ったデータに基づいて上記スイッチを切り替える制御部とを備え、上記光ディスクの記録動作に際して、同ディスクの線速度を算出し、この線速度に応じて遅延時間を設定するようにしたので、光ディスクの線速度に最適な記録信号（3T伸長信号）を自動的に得ることができ、各異なる線速度の光ディスクに適用することができ、また光ディスクの再生にあたってはアイバタンのジッタの低減、ひいてはエラーレイトの低減を図ることができる。

【図面の簡単な説明】

【図1】この発明の一実施例を示す光ディスクの記録信号生成回路の概略的ブロック線図である。

【図2】従来の光ディスクの記録信号生成回路の概略的ブロック線図である。

【図3】光ディスクの記録信号生成回路の動作を説明する概略的タイムチャート図である。

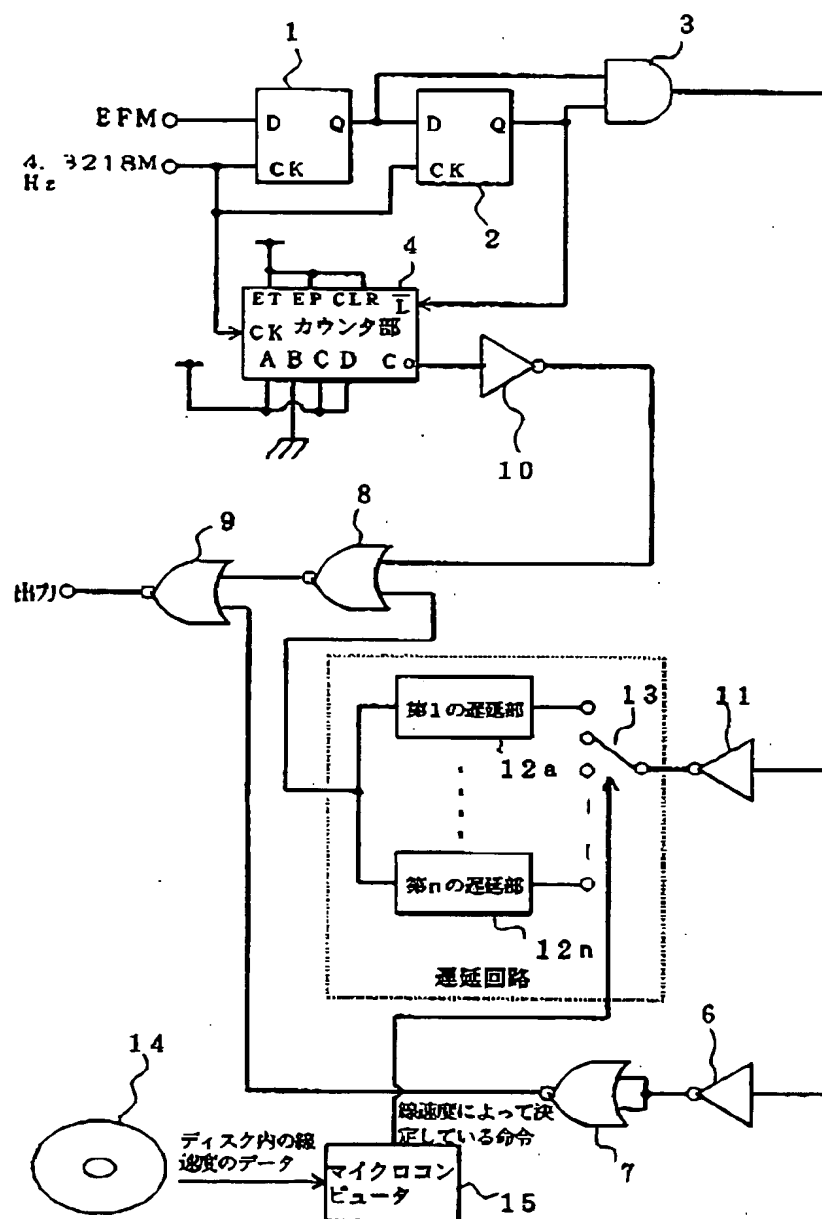
【符号の説明】

- 1 第1のDタイプF・F部
- 2 第2のDタイプF・F部
- 3 アンド回路
- 4 カウンタ部
- 6, 10, 11 インバータ
- 7 第1のノア回路
- 8 第2のノア回路
- 9 第3のノア回路
- 12a 第1の遅延部
- 12n 第nの遅延部
- 13 スイッチ
- 14 光ディスク
- 15 マイクロコンピュータ

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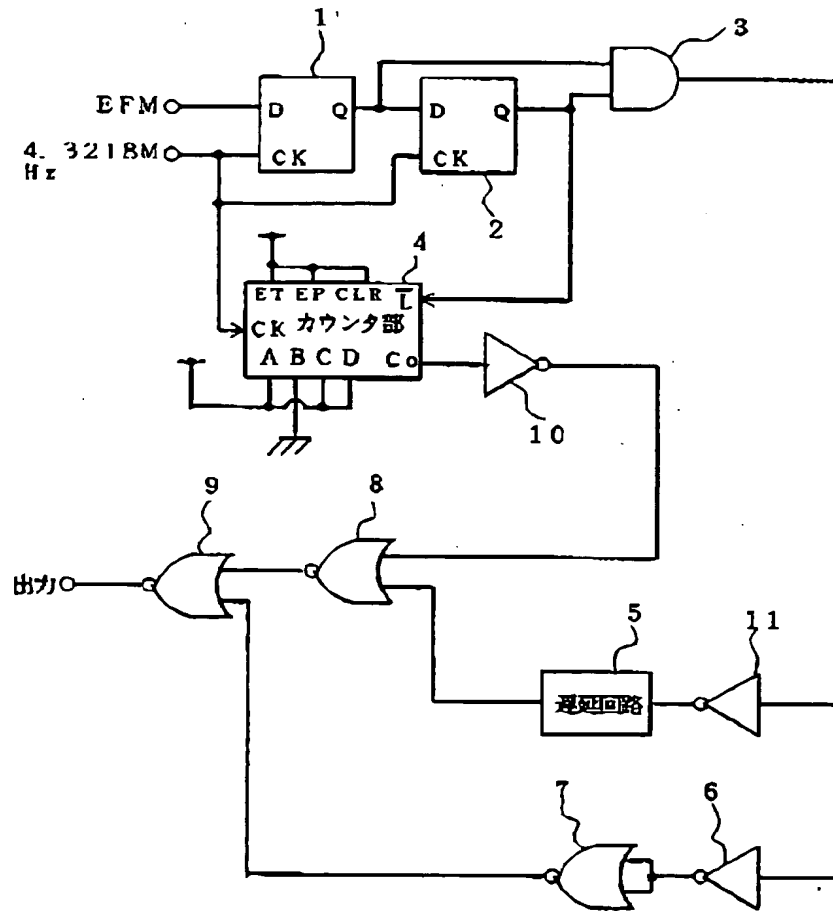
【図1】



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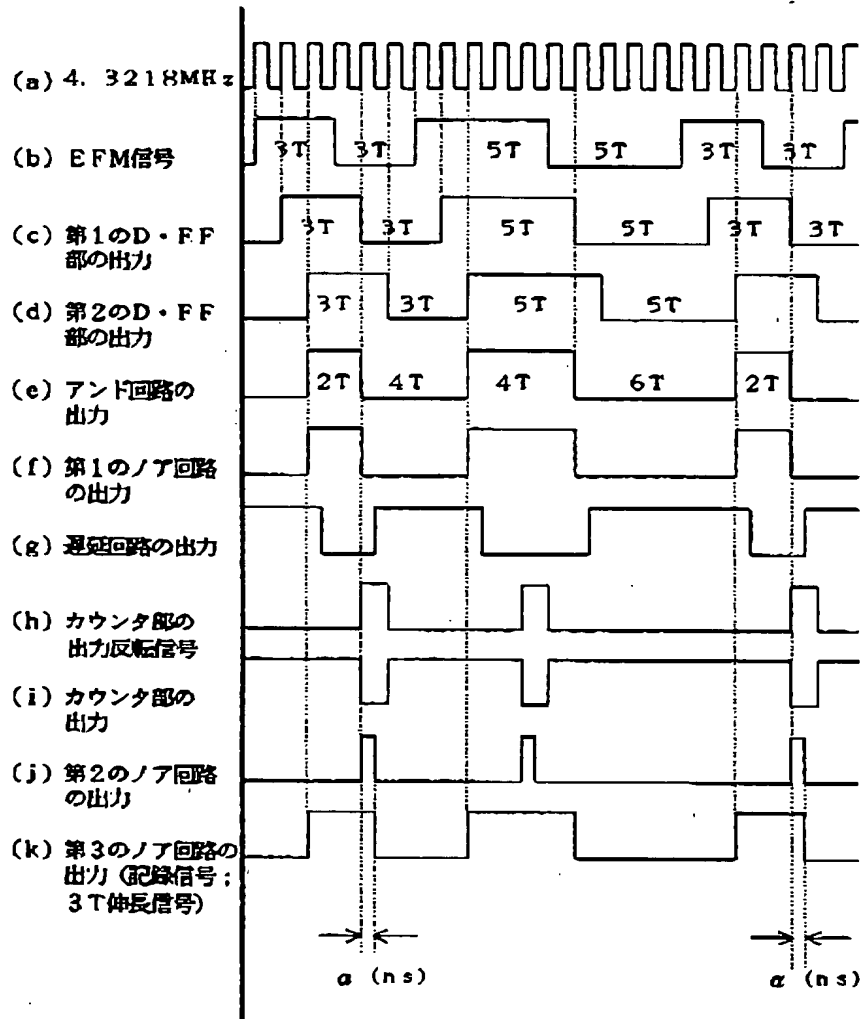
【図2】



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【図3】



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CLAIMS

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[Claim(s)]

[Claim 1] As if the signal of 3T of a signal thru/or 11T by the modulation technique of EFM is carried out -1T, it considers as the signal of 2T thru/or 10T and predetermined time delay of the signal of this 2T thru/or 10T is carried out at the time of record actuation of an optical disk, both In the record signal generation circuit of the optical disk which adds only to 2of signal of 2T which carried out [ aforementioned ] delayed this signal -1T thru/or 10T T signal, and generates a record signal Aforementioned -1T Two or more delay means which carry out predetermined time delay of the signal of 2T thru/or 10T carried out according to the linear velocity of said optical disk, While reading the data of linear velocity with a selection means to choose any of two or more of these delay means, and the ATIP signal in said optical disk The record signal generation circuit of the optical disk characterized by making it only the time delay which was equipped with the control means which controls said selection means according to this reading \*\*\*\*\* linear velocity, set up the time delay according to the linear velocity of said optical disk, and said-set up the signal of 2T thru/or 10T carried out [ aforementioned ] -1T delayed.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the record signal generation circuit of the optical disk which changes the signal ("0" or "1") by the modulation technique called EFM (Eight to Fourteen Modulation) into 3T expanding signal, and acquires a record signal.

[0002]

[Conventional example] Conventionally this kind of record signal generation circuit for example, for jitter reduction of an optical disk The 1st D type F-F (flip-flop) section 1 which is carrying out the configuration shown in drawing 2, and is delayed by 1 of a channel clock (4.3218MHz) clock in the signal (die-length; 3T thru/or 11T which "0" or "1" follows) by EFM, The 2nd D type F-F (flip-flop) section 2 delayed by further 1 clock in this signal (shown in drawing 3 (c)) delayed one clock, The AND of these signals that carried out 1 clock delay, and the signal delayed two clocks is taken. 1T 2 AND circuits 3 for acquiring the signal (shown in drawing 3 (e)) of 2T thru/or 10T carried out, The counter section 4 which uses the above-mentioned channel clock as a counter clock, and is counted two clocks with Q output signal of the 2nd D type F-F (flip-flop) section 2, The delay circuit 5 which carries out predetermined time delay of the reversal signal of the output signal (2T thru/or 10T signal) of above-mentioned 2 AND circuit 3, The inverter circuit 6 and 1st NOR circuit 7 for shaping the output signal of above-mentioned 2 AND circuit 3 in waveform, 2nd NOR circuit 8 which carries out the OR of 2T thru/or 10T signal which carried out [ above-mentioned ] delay, and the carry signal (Co) by 2 clock counts of the above-mentioned counter section 4, It has 3rd NOR circuit 9 which carries out the OR of the output signal of 2 AND circuits 3 which carried out [ above-mentioned ] waveform shaping with the output signal of this 2nd NOR circuit 8. In addition, 10 and 11 are inverters.

[0003] According to the record signal generation circuit of the above-mentioned configuration, as shown in drawing 3 R> 3 (e), from above-mentioned AND circuit 3, the signal of 2T thru/or 10T carried out one from the signal of 3T thru/or 11T by Above EFM is outputted.

Predetermined time (alpha (ns)) delay of the signal of these 2T thru/or 10T is carried out in a delay circuit, and he adds this delayed signal only to 2of signal of above-mentioned 2T thru/or 10T T signal, and is trying to acquire a record signal (3T expanding signal) (shown in drawing (k)).

[0004]

[Problem(s) to be Solved by the Invention] by the way, the record signal generation circuit of the above-mentioned optical disk -- setting -- one kind of optical disk (disk of predetermined linear velocity) -- receiving -- carrying out -- although it was applicable that is, it can decide only on one expanding time amount, but there is a thing of how many kinds of linear velocity (for example, 1.2 m/s - 1.4 m/s) as an optical disk, and the optimal record signal was not able to be acquired to all these optical disks.

[0005] This invention is made in view of the above-mentioned technical problem, and that purpose is in offering the record signal generation circuit of the optical disk which enabled it to acquire the optimal record signal (3T expanding signal) according to the linear velocity of each optical disk.

[0006]



[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention at the time of record actuation of an optical disk As if the signal (die-length;3T thru/or 11T which "0" or "1" follows) by the modulation technique of EFM is carried out -1T, it considers as the signal of 2T thru/or 10T and predetermined time delay of this signal of 2T thru/or 10T is carried out, both In the record signal generation circuit of the optical disk which adds only to 2of signal of 2T which carried out [ above-mentioned ] this delayed signal -1T thru/or 10T T signal, and generates 3T expanding signal (record signal) Above-mentioned -1T Two or more delay sections which carry out predetermined time delay of the signal of 2T thru/or 10T carried out according to the linear velocity of the above-mentioned optical disk, While reading the data of linear velocity with the switch which chooses any of two or more of these delay sections, and the ATIP signal in the above-mentioned optical disk It has the microcomputer which changes the above-mentioned switch according to this read linear velocity, and let it be a summary to have set up the time delay according to the linear velocity of the above-mentioned optical disk.

[0007]

[Function] Since it considered as the above-mentioned configuration, if it is in record actuation of the above-mentioned optical disk, the data of the linear velocity of this optical disk are obtained with the above-mentioned microcomputer, and it is chosen according to this data any of two or more above-mentioned delay sections they are.

[0008] thereby, the signal of 2T thru/or 10T carried out [ above-mentioned ] -1T is delayed by only that setting time delay -- having -- this delayed signal -- said -- since it adds only to signal 2T signal of 2T thru/or 10T and 3T expanding signal (record signal) is acquired -- the optimal record signal for the above-mentioned linear velocity -- it can obtain -- each -- \*\* -- it is applicable to the optical disk of linear velocity.

[0009]

[Example] Hereafter, the example of this invention is explained based on drawing 1 . In addition, among drawing, the same sign is given to the same part as drawing 2 , and duplication explanation is omitted.

[0010] In drawing 1 , the record signal generation circuit of the optical disk of this invention is equipped with the switch 13 which chooses the 1st [ a setup of a time delay which replaces with the delay circuit 5 shown in drawing 2 , and is different, respectively of is enabled ] thru/or n-th delay sections 12a, --, 12n and these delay sections 12a, --, 12n.

[0011] Moreover, this record signal generation circuit is equipped with the microcomputer 15 which issues selection directions of the 1st thru/or n-th delay section 12a, --, 12n according to the data of this read linear velocity while it reads the data of the linear velocity of the optical disk concerned contained in the ATIP signal in an optical disk 14, in order to change the above-mentioned switch 13.

[0012] In the record signal generation circuit of the optical disk of the above-mentioned configuration It faces generating 3T expanding signal (record signal) from the signal (signal of die-length;3T which "0" or "1" follows 11T3T thru/or 11T) by the modulation technique called EFM (Eightto Fourteen Modulation). The data of the linear velocity in an optical disk 14 (contained in the ATIP signal) are read with a microcomputer 15, and the control signal which changes the above-mentioned switch 13 according to this read data is outputted.

[0013] That is, the time delay of the signal (see drawing 3 (e)) of 2T which are outputted from AND circuit 3 and which were carried out -one thru/or 10T is set up the optimal so that the optimal record signal for the linear velocity of the above-mentioned optical disk 14 may be generated.

[0014] then, as usual, -one is taken [ above-mentioned ], the signal of 2T thru/or 10T is delayed, it is added only to the signal this delayed signal of whose is 2T, and this added signal is made into a record signal (3T expanding signal) (see drawing 3 (k)) -- in this way On the occasion of record actuation of an optical disk, the above-mentioned time delay is automatically set as a different linear velocity according to the linear velocity of this optical disk, and the optimal record signal (3T expanding signal) can be acquired.

[0015] Moreover, since it is recording with 3T expanding signal which suited the linear velocity of an optical disk on the occasion of the playback of an optical disk 14 which carried out [ above-

mentioned ] record, the jitter of an eye pattern can be reduced and reduction of error REITO can be aimed at.

[0016]

[Effect of the Invention] As explained above, according to the record signal generation circuit of this invention, it considers as 2T thru/or 10T signal which carried out the signal (signal of 3T thru/or 11T) by EFM -one. In the record signal generation circuit of the optical disk which carries out \*\*\*\*\* time delay of the signal of these 2T thru/or 10T, adds this delayed time amount only to 2T signal, and acquires a record signal (3T expanding signal) The switch which changes the delay section and these delay section of a different time delay, Read the data of the linear velocity in the above-mentioned optical disk (inside of an ATIP signal), have the control section which changes the above-mentioned switch based on this read data, and record actuation of the above-mentioned optical disk is faced. Since the linear velocity of this disk is computed and the time delay was set up according to this linear velocity the optimal record signal (3T expanding signal) for the linear velocity of an optical disk -- automatic -- it can obtain -- each -- \*\* -- it can apply to the optical disk of linear velocity, and reduction of the jitter of an eye pattern, as a result reduction of error REITO can be aimed at in playback of an optical disk.

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TECHNICAL FIELD

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[Industrial Application] This invention relates to the record signal generation circuit of the optical disk which changes the signal ("0" or "1") by the modulation technique called EFM (Eight to Fourteen Modulation) into 3T expanding signal, and acquires a record signal.

[0002]

[Conventional example] Conventionally this kind of record signal generation circuit for example, for jitter reduction of an optical disk The 1st D type F-F (flip-flop) section 1 which is carrying out the configuration shown in drawing 2 , and is delayed by 1 of a channel clock (4.3218MHz) clock in the signal (die-length; 3T thru/or 11T which "0" or "1" follows) by EFM, The 2nd D type F-F (flip-flop) section 2 delayed by further 1 clock in this signal (shown in drawing 3 (c)) delayed one clock, The AND of these signals that carried out 1 clock delay, and the signal delayed two clocks is taken. -1T 2 AND circuits 3 for acquiring the signal (shown in drawing 3 (e)) of 2T thru/or 10T carried out, The counter section 4 which uses the above-mentioned channel clock as a counter clock, and is counted two clocks with Q output signal of the 2nd D type F-F (flip-flop) section 2, The delay circuit 5 which carries out predetermined time delay of the reversal signal of the output signal (2T thru/or 10T signal) of above-mentioned 2 AND circuit 3, The inverter circuit 6 and 1st NOR circuit 7 for shaping the output signal of above-mentioned 2 AND circuit 3 in waveform, 2nd NOR circuit 8 which carries out the OR of 2T thru/or 10T signal which carried out [ above-mentioned ] delay, and the carry signal (Co) by 2 clock counts of the above-mentioned counter section 4, It has 3rd NOR circuit 9 which carries out the OR of the output signal of 2 AND circuits 3 which carried out [ above-mentioned ] waveform shaping with the output signal of this 2nd NOR circuit 8. In addition, 10 and 11 are inverters.

[0003] According to the record signal generation circuit of the above-mentioned configuration, as shown in drawing 3 R> 3 (e), from above-mentioned AND circuit 3, the signal of 2T thru/or 10T carried out -one from the signal of 3T thru/or 11T by Above EFM is outputted.

Predetermined time (alpha (ns)) delay of the signal of these 2T thru/or 10T is carried out in a delay circuit, and he adds this delayed signal only to 2of signal of above-mentioned 2T thru/or 10T T signal, and is trying to acquire a record signal (3T expanding signal) (shown in drawing (k)).

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[Translation done.]

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EFFECT OF THE INVENTION

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[Effect of the Invention] As explained above, according to the record signal generation circuit of this invention, it considers as 2T thru/or 10T signal which carried out the signal (signal of 3T thru/or 11T) by EFM -one. In the record signal generation circuit of the optical disk which carries out \*\*\*\*\* time delay of the signal of these 2T thru/or 10T, adds this delayed time amount only to 2T signal, and acquires a record signal (3T expanding signal) The switch which changes the delay section and these delay section of a different time delay, Read the data of the linear velocity in the above-mentioned optical disk (inside of an ATIP signal), have the control section which changes the above-mentioned switch based on this read data, and record actuation of the above-mentioned optical disk is faced. Since the linear velocity of this disk is computed and the time delay was set up according to this linear velocity the optimal record signal (3T expanding signal) for the linear velocity of an optical disk -- automatic -- it can obtain -- each -- \*\* -- it can apply to the optical disk of linear velocity, and reduction of the jitter of an eye pattern, as a result reduction of error REITO can be aimed at in playback of an optical disk.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] by the way, the record signal generation circuit of the above-mentioned optical disk -- setting -- one kind of optical disk (disk of predetermined linear velocity) -- receiving -- carrying out -- although it was applicable that is, it can decide only on one expanding time amount, but there is a thing of how many kinds of linear velocity (for example, 1.2 m/s - 1.4 m/s) as an optical disk, and the optimal record signal was not able to be acquired to all these optical disks.

[0005] This invention is made in view of the above-mentioned technical problem, and that purpose is in offering the record signal generation circuit of the optical disk which enabled it to acquire the optimal record signal (3T expanding signal) according to the linear velocity of each optical disk.

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MEANS

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[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention at the time of record actuation of an optical disk As if the signal (data-length;3T thru/or 11T which "0" or "1" follows) by the modulation technique of EFM is carried out -1T, it considers as the signal of 2T thru/or 10T and predetermined time delay of this signal of 2T thru/or 10T is carried out, both In the record signal generation circuit of the optical disk which adds only to 2of signal of 2T which carried out [ above-mentioned ] this delayed signal -1T thru/or 10T T signal, and generates 3T expanding signal (record signal) Above-mentioned -1T Two or more delay sections which carry out predetermined time delay of the signal of 2T thru/or 10T carried out according to the linear velocity of the above-mentioned optical disk, While reading the data of linear velocity with the switch which chooses any of two or more of these delay sections, and the ATIP signal in the above-mentioned optical disk It has the microcomputer which changes the above-mentioned switch according to this read linear velocity, and let it be a summary to have set up the time delay according to the linear velocity of the above-mentioned optical disk.

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OPERATION

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[Function] Since it considered as the above-mentioned configuration, if it is in record actuation of the above-mentioned optical disk, the data of the linear velocity of this optical disk are obtained with the above-mentioned microcomputer, and it is chosen according to this data any of two or more above-mentioned delay sections they are.

[0008] thereby, the signal of 2T thru/or 10T carried out [ above-mentioned ] -1T is delayed by only that setting time delay -- having -- this delayed signal -- said -- since it adds only to signal 2T signal of 2T thru/or 10T and 3T expanding signal (record signal) is acquired -- the optimal record signal for the above-mentioned linear velocity -- it can obtain -- each -- \*\* -- it is applicable to the optical disk of linear velocity.

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EXAMPLE

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[Example] Hereafter, the example of this invention is explained based on drawing 1 . In addition, among drawing, the same sign is given to the same part as drawing 2 , and duplication explanation is omitted.

[0010] In drawing 1 , the record signal generation circuit of the optical disk of this invention is equipped with the switch 13 which chooses the 1st [ a setup of a time delay which replaces with the delay circuit 5 shown in drawing 2 , and is different, respectively of is enabled ] thru/or n-th delay sections 12a, --, 12n and these delay sections 12a, --, 12n.

[0011] Moreover, this record signal generation circuit is equipped with the microcomputer 15 which issues selection directions of the 1st thru/or n-th delay section 12a, --, 12n according to the data of this read linear velocity while it reads the data of the linear velocity of the optical disk concerned contained in the ATIP signal in an optical disk 14, in order to change the above-mentioned switch 13.

[0012] In the record signal generation circuit of the optical disk of the above-mentioned configuration It faces generating 3T expanding signal (record signal) from the signal (signal of die-length;3T which "0" or "1" follows 11T3T thru/or 11T) by the modulation technique called EFM (Eightto Fourteen Modulation). The data of the linear velocity in an optical disk 14 (contained in the ATIP signal) are read with a microcomputer 15, and the control signal which changes the above-mentioned switch 13 according to this read data is outputted.

[0013] That is, the time delay of the signal (see drawing 3 (e)) of 2T which are outputted from AND circuit 3 and which were carried out -one thru/or 10T is set up the optimal so that the optimal record signal for the linear velocity of the above-mentioned optical disk 14 may be generated.

[0014] then, as usual, -one is taken [ above-mentioned ], the signal of 2T thru/or 10T is delayed, it is added only to the signal this delayed signal of whose is 2T, and this added signal is made into a record signal (3T expanding signal) (see drawing 3 (k)) -- in this way On the occasion of record actuation of an optical disk, the above-mentioned time delay is automatically set as a different linear velocity according to the linear velocity of this optical disk, and the optimal record signal (3T expanding signal) can be acquired.

[0015] Moreover, since it is recording with 3T expanding signal which suited the linear velocity of an optical disk on the occasion of the playback of an optical disk 14 which carried out [ above-mentioned ] record, the jitter of an eye pattern can be reduced and reduction of error REITO can be aimed at.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the rough block diagram of the record signal generation circuit of the optical disk in which one example of this invention is shown.

[Drawing 2] It is the rough block diagram of the record signal generation circuit of the conventional optical disk.

[Drawing 3] It is a rough timing diagram Fig. explaining actuation of the record signal generation circuit of an optical disk.

[Description of Notations]

1 1st D Type F-F Section

2 2nd D Type F-F Section

3 AND Circuit

4 Counter Section

6, 10, 11 Inverter

7 1st NOR Circuit

8 2nd NOR Circuit

9 3rd NOR Circuit

12a The 1st delay section

12n The n-th delay section

13 Switch

14 Optical Disk

15 Microcomputer

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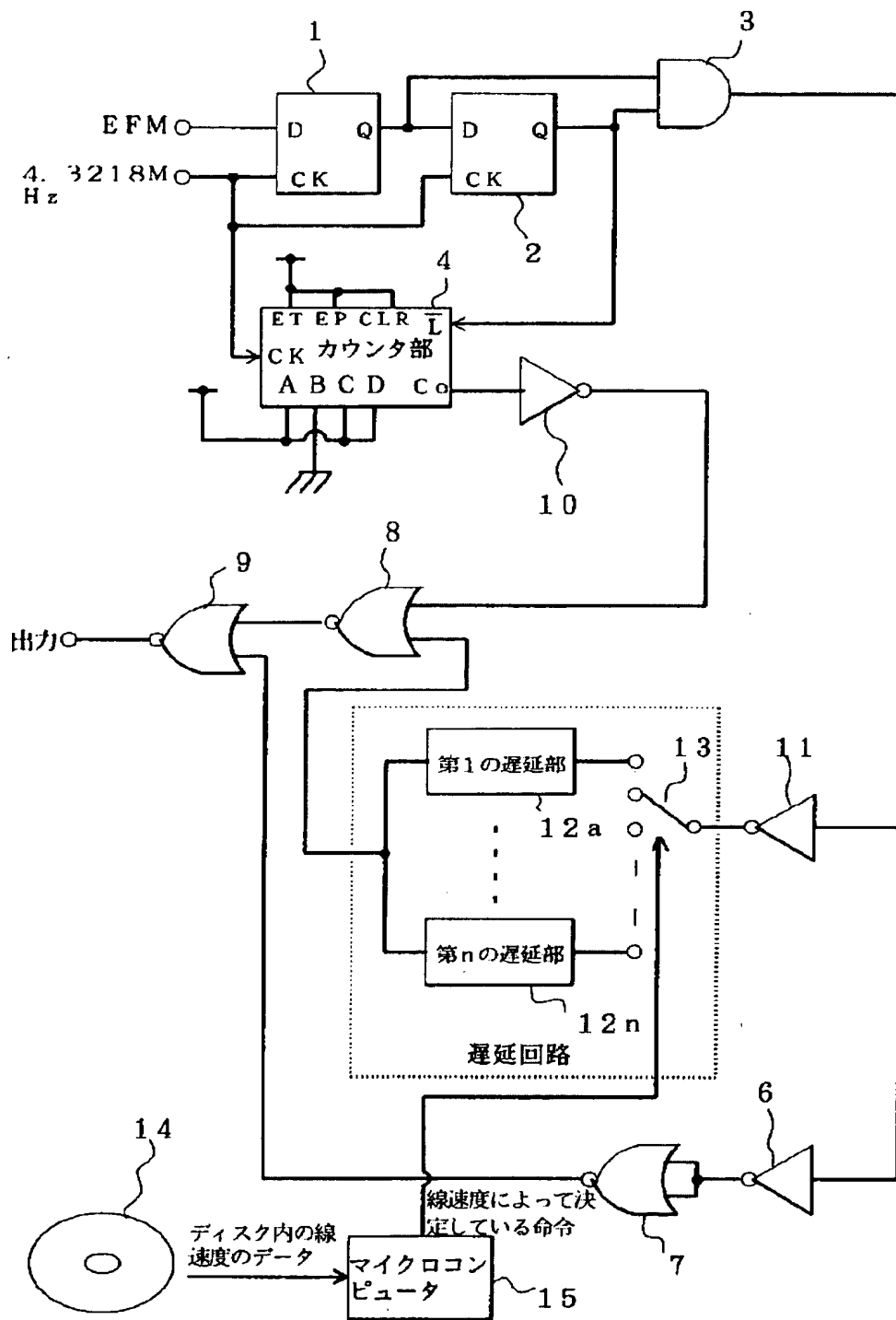
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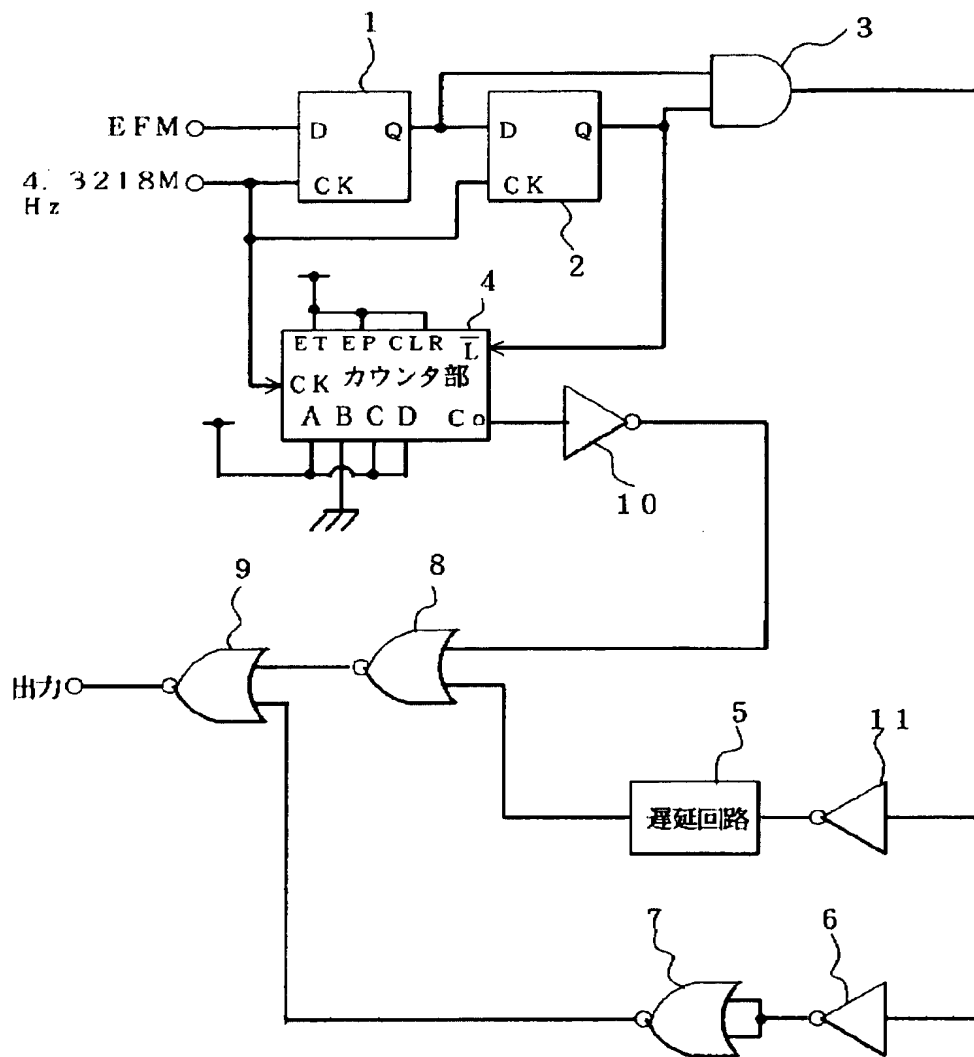
DRAWINGS

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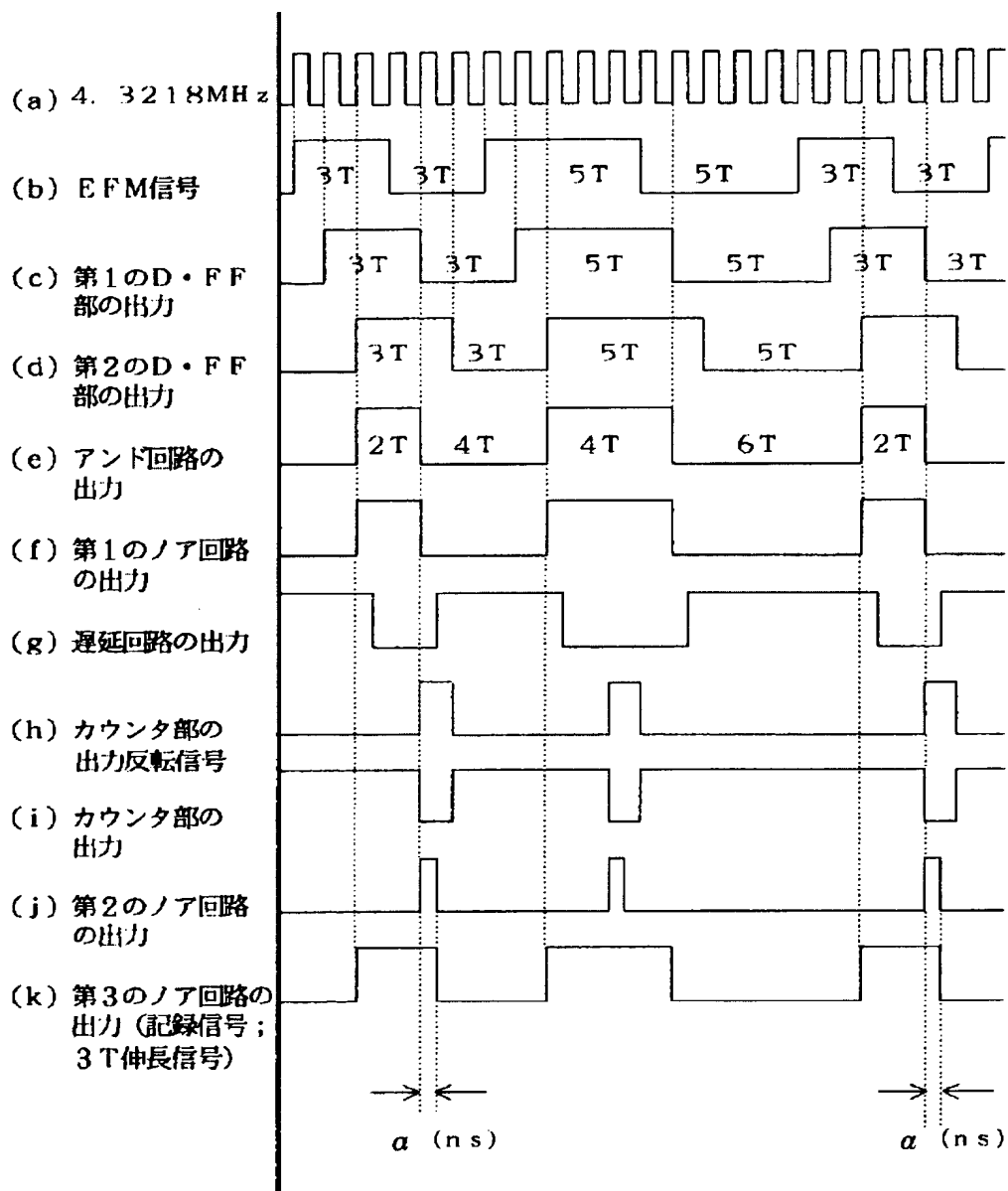
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]

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